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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,486	10/23/2002	Tin-Su Pan	124695	7326

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EXAMINER

SHEARIN, ANDREW J

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/065,486

Applicant(s)

PAN ET AL.

Examiner

Andrew Shearin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/6/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of there appears to be minor mistakes: 'breath' instead of 'breathe' on page 3, paragraphs 7-8; extraneous 'x-ray beam 14' page 14, paragraph 28 line 6; 'include' instead of 'includes' on page 8, paragraph 30, line 11; "coached' instead of 'couched' on page 9, paragraph 34, line 2; 'disclosed' instead of 'discloses' on page 10, paragraph 35, line 5; 'phases' instead of 'phase' on page 12, paragraph 38, line 4; use of 'cine' is confusing, Examiner assumes 'sine' for purposes of examination; and 'may' instead of 'my' on page 14, paragraph 42, line 7. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 9-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 9 claims an object that refers to a patient, which inferentially claims the human body. A human body does not encompass any of the statutory categories of invention.
3. Claims 18-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. A signal does not encompass any of the statutory categories of invention.

Claim Objections

4. Claim 9 is objected to because of the following informalities: 'so as to be communicated with said imaging system' is confusing; for purposes of examination the Examiner assumes communicated to mean scanned. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-17 and 21-28 rejected under 35 U.S.C. 102(b) as being anticipated by Varian Medical Systems (<http://web.archive.org/web/20010304174429/http://www.varian.com/onc/prd057.html>), herein after known as Varian. Regarding claims 1, 3-4, 6-7, 9, 11-15, 21, 24, and 26-28, Varian discloses: determining a target area of interest (Varian page 2, line 10); obtaining scout image data responsive to said target area with an imaging system (Varian page 2, line 3-6); processing said target area so as to create a sub-target area of interest (Varian page 2, line 7-12 wherein correlating image/motion data with a tumor creates a sub-target); computing a desired target acquisition time, operating said imaging system, and combining said image data (Varian page 2, line 9-12 and the caption of the second image on the right side discloses use of Varian's Respiratory Gating system in conjunction with CT); wherein said target area of interest corresponds to a size of a target (Varian page 2, lines 9-12 wherein using a tumor as the target

means that the target area changes based on the size of the tumor); implementing a wrap around technique if the reference point occurs while said imaging system is not imaging (Varian page 2, lines 21-23); processing said image data to determine a phase of said image data and synchronizing said data (Varian page 2, line 7-12 wherein determining when said sub-target area falls within a certain state is determining a phase); and proof that these methods are automated (Varian page 1, image 1 indicates a threshold line; page 2 second image demonstrates use with CT imaging which inherently uses a computer and a program; page 2 discloses the use of an automatic treatment hold based on detected deviations; and page 2 discloses accurate beam on times less than 100 msec).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 2 is rejected under U.S.C. 103(a) as being unpatentable over Varian in view of EP 1090586. Varian teaches all aspect of the claim except wherein the sub-target area corresponds to the size of the detector on a selected axis. It is an obvious aspect of CT imaging that slices of a CT imaging device correspond with the size of a detector on a selected axis. It would have been obvious to one skilled in the art at the time the invention was made to subdivide the target area into sub-targets or slices when

planning a gated imaging sequence as shown in (EP 1090586 clause 50, wherein a segment is a sub-target).

7. Claim 10 is rejected under U.S.C. 103(a) as being unpatentable over Varian in view of EP 1090586. Varian teaches all aspect of the claim except wherein the sub-target area corresponds to the size of the detector on a selected axis. It is an inherent aspect of CT imaging that slices of a CT imaging device correspond with the size of a detector on a selected axis and it would have been obvious to one skilled in the art at the time the invention was made to subdivide the target area into sub-targets or slices when planning a gated imaging sequence as shown in (EP 1090586 clause 50, wherein a segment is a sub-target).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varian in view of EP 1090586. Varian teaches all aspect of the claim except wherein the acquisition time of said image data corresponding to a physiological cycle plus at least one of two thirds of a gantry rotation time and one gantry rotation time. EP 1090586 teaches asynchronous imaging of a target area. It would have been obvious to one skilled in the art at the time the invention was made to set the acquisition time to one physiological cycle plus at least one of two thirds or one gantry rotation time in order to asynchronously image the target area (EP 1090586 paragraph 25 lines 3-7) in order to create a system that greatly improves temporal resolution (EP 1090586 paragraph 6).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varian in view of BettyAnn Chodkowski,

http://godzilla.kennedykrieger.org/~bettyann/msThesis/ms060_thesis/ms060_20bkg.html, herein

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after Chodkowski. Varian teaches all aspects of the claim except synchronizing PET emission data with phase. Chodowski does teach registering PET emission data with CT data and since the CT data is synchronized with phase the PET emission data is synchronized with phase. It would have been obvious to one skilled in the art at the time the invention was made to synchronize PET emission data with a gating system since registering and comparing volumes of interest on a set of PET and CT images capitalizes on the unique advantages of each imaging system; PET images distinguish between radiation necrosis and tumor recurrence and CT scans are better for isodose calculations (Chodkowski, page 2, paragraph 2).

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varian in view of EP 1090586. Varian teaches all aspect of the claim except wherein the acquisition time of said image data corresponding to a physiological cycle plus at least one of two thirds of a gantry rotation time and one gantry rotation time. EP 1090586 teaches asynchronous imaging of a target area. It would have been obvious to one skilled in the art at the time the invention was made to set the acquisition time to one physiological cycle plus at least one of two thirds or one gantry rotation time in order to asynchronously image the target area (EP 1090586 paragraph 25 lines 3-7) in order to create a system that greatly improves temporal resolution (EP 1090586 paragraph 6).

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varian in view of Chodkowski. Varian teaches all aspects of the claim except synchronizing PET emission data with phase. Chodowski does teach registering PET emission data with CT data and since the CT data is synchronized with phase the PET emission data is

synchronized with phase. It would have been obvious to one skilled in the art at the time the invention was made to synchronize PET emission data with a gating system since registering and comparing volumes of interest on a set of PET and CT images capitalizes on the unique advantages of each imaging system; PET images distinguish between radiation necrosis and tumor recurrence and CT scans are better for isodose calculations (Chodkowski, page 2, paragraph 2).

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varian in view of EP 1090586. Varian teaches all aspect of the claim except wherein the acquisition time of said image data corresponding to a physiological cycle plus at least one of two thirds of a gantry rotation time and one gantry rotation time. EP 1090586 teaches asynchronous imaging of a target area. It would have been obvious to one skilled in the art at the time the invention was made to set the acquisition time to one physiological cycle plus at least one of two thirds or one gantry rotation time in order to asynchronously image the target area (EP 1090586 paragraph 25 lines 3-7) in order to create a system that greatly improves temporal resolution (EP 1090586 paragraph 6).

13. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varian in view of Chodkowski. Varian teaches all aspects of the claim except synchronizing PET emission data with phase. Chodkowski does teach registering PET emission data with CT data and since the CT data is synchronized with phase the PET emission data is synchronized with phase. It would have been obvious to one skilled in the art at the time the invention was made to synchronize PET emission data with a gating system since registering and comparing volumes of interest on a set of PET and CT images

capitalizes on the unique advantages of each imaging system; PET images distinguish between radiation necrosis and tumor recurrence and CT scans are better for isodose calculations (Chodkowski, page 2, paragraph 2).

14. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varian in view of EP 1090586. Varian teaches all aspects of the claim except reference point as a zero phase; assign a phase of zero to an i th reference point of said system data and assign 2π phase for each subsequent cycle in order to better register breathing cycle. EP 1090586 does teach reference point as a zero phase; assign a phase of zero to an i th reference point of said system data and assign 2π phase for each subsequent cycle in order to better register breathing cycle. It would have been obvious to one skilled in the art at the time the invention was made to establish a reference point as a zero phase; assign a phase of zero to an i th reference point of said system data and assign 2π phase for each subsequent cycle in order to better register breathing cycle (EP 1090586 paragraph 28, wherein a heart beat and a breath cycle are cyclical events, but a heart beat is not continuous. In a continuous breath cycle it is natural to use radians instead of discrete variables such as S or θ).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Shearin whose telephone number is (571)272-4744. The examiner can normally be reached on 7:30-5:00 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on (571)272-4956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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